



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,232	09/28/2001	Janet R. Easton	POU920010063US1	5863

7590 04/02/2004

Floyd A. Gonzalez
IBM Corporation
2455 South Road, P386
Poughkeepsie, NY 12601

EXAMINER

CHEN, ALAN S

ART UNIT PAPER NUMBER

2182

DATE MAILED: 04/02/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/966,232

Applicant(s)

EASTON ET AL.

Examiner

Alan S Chen

Art Unit

2182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,5-7,11-13,17-19,23 and 24 is/are rejected.
- 7) ☒ Claim(s) 2-4, 8-10, 14-16 and 20-22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/28/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Fritz Fleming
FRITZ FLEMING
PRIMARY EXAMINER
GROUP 2100

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Double Patenting

1. Applicant is advised that should claims 1-6 be found allowable, claims 7-12 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Objections

2. Claims 2, 8, 14 and 20 objected to because of the following informalities: the word "override" is misspelled in multiple places within these claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 5-7, 11-13, 17-19, 23 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by No. US 20020099752A1 to Markos et al. (hereafter Markos).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

Art Unit: 2182

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

5. As per claim 1, 7, 13 and 19, Markos discloses an apparatus, method, and program product (Fig. 1) comprising: a processor (Fig. 1, element 130) handling an I/O request in an I/O operation (paragraph 28); main storage controller by the processor for storing data (Fig. 1, element 120); one or more I/O devices for sending data to or receiving data from said main storage (Fig. 1, labeled I/O devices); a vector mechanism operable to register I/O requests by said devices to send or receive data from said main storage (the Queued Direct I/O, QDIO for short, have a plurality of fields called queued components, paragraph 39, that in part, describe if it is for reading, e.g., output, or writing, e.g., input to the queue, as well as having the data being transferred, and hence considered "vectored". Fig. 5 and 6 give details on the other components in the QDIO); a dispatcher operable to poll said vector mechanism to determine if there is an outstanding I/O request (controller, Fig. 1, element 120 has a finite state machine (FSM), see paragraph 153, polling occurs in first loop, e.g., in the Output Queue Program, where the Current_State = primed and output data exists); and an override bit having a first condition when an immediate interrupt is to be sent to said processor for handling an I/O request from said I/O device(s) (can be the primed state, where the bits are set such that the processor knows, inherently signaled via an interrupt or some form of flag signal, that a request is ready to be processed. Condition can also be an error state where the processor is immediately notified to halt processing a I/O request), and a second condition when said dispatcher is to poll said vector

Art Unit: 2182

mechanism to determine if there is an outstanding I/O request (second condition is described by the bits that describe the FSM state, paragraph 153), said override bit being set to its first condition or reset to its second condition by said processor (processor has control of what the FSM is set to, Paragraph 28). Note that the states in the FSM are described by multiple bits. Given that there are only two conditions claimed, e.g., polling and I/O handling, it is inherent such that although the FSM is composed on multiple bits, only one of the bits need to be flipped to distinguish between two states. Therefore, this bit that is flipped can be designated the override bit.

6. As per claims 5, 6, 11, 12, 17, 18, 23 and 24, it is inherent that the FSM disclosed by Markos defaults to a state that will constantly check for I/O requests to be processed (the second condition) whenever possible, since monitoring and executing I/O requests from I/O devices is the main function of the apparatus. Markos emphasizes speed of communication between I/O devices and host (as does the applicant), and to do so, I/O requests must be processed as soon as possible (e.g., I/O request must be detected ASAP) to minimize latency.

Allowable Subject Matter

7. Claims 2-4, 8-10, 14-16 and 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is the statement of reasons for the indication of allowable subject matter: The prior art disclosed by the applicant and cited by the Examiner fail to teach or suggest, alone or in combination, an apparatus, method and program product disclosed in claims 1, 7, 13 and 19, further comprising a Target Delay interval register used in conjunction with the override bit.

Art Unit: 2182

Furthermore, the prior art does not disclose the processor being a hypervisor in addition to the main storage element being divided into multiple partitions, each having its own override bit.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to I/O request handling and hypervisors:

U.S. Pat. No. US006332171B1 to Baskey et al.

U.S. Pat. No. US006332180B1 to Kauffman et al.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S Chen whose telephone number is 703-605-0708. The examiner can normally be reached on M-F 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on 703-308-3301. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


FRITZ FLEMING
PRIMARY EXAMINER
GROUP 2100